REMARKS

Claims 1-23 have been amended to overcome formal objections and further patentably distinguish the invention from the prior art. Claims 24-28 have been canceled. The description has been amended to overcome a formal objection. A proposed drawing correction to FIG. 5B proposing labels for the vertical and horizontal axes in red is attached. Such cancellation of and amendments to claims are only for the purpose of expediting the prosecution of this application and are not to be construed as an abandonment of any of the novel concepts disclosed therein.

1. The objection to FIG. 5B is noted. We propose amending the drawing as indicated on the attached sketch in red by labeling the ordinate axis --Db-- and the abscissa axis as --Frequency (Hz)--.

2. The disclosure was objected to because of the informality on page 3, line 22 omitting the application number. We have deleted that sentence.

3. Claims 1-10 and 18-20 stand rejected under 35 U.S.C. §112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which Applicant regards as the invention. Claim 1 was said to include the limitation "a first frequency range" in both lines 3 and 7 of the claim. We have amended the claim to change "a" to --said-- on line 7.

Claims 3 and 9 stood rejected for containing period marks. We have amended these claims to delete the period marks.

Claims 18 and 19 include the limitations "frequency spacing of approximately 16" and "spacing factor between 3 and 5" respectively. It was said to not be understood what was meant. Antecedent support for this language is found in the last paragraph on page 7 of the specification.

Claims 18 and 19 also include the limitation "fourth all-pass filter coupling said first all-pass filter and said combiner." We have amended these claims as suggested to call for the fourth all-pass filter coupling, the second all-pass filter and the combiner.

Claim 20 includes the limitation "for filtering said first low-ass filter for filtering". We have amended this phrase to correct the typographical error and recite the missing words.

Accordingly, withdrawal of the rejection of claims 1-10 and 18-20 as indefinite is respectfully requested.

4. Claims 1-6, 11-14 and 22-23 as originally presented stood rejected under 35 U.S.C. §102(b) as anticipated by Robinson. The reference is said to disclose a method and apparatus for enhancing a stereo signal. Such a system, as illustrated in FIG. 1A, is said to involve the modification of two different input signals on two input lines (20, 24) (col. 4, lines 1-4). These two signals, said to be derived initially from stereo audio signals, are said to read on "a first audio signal from a first audio channel and a second audio signal from a second audio channel" (col. 3, lines 58-61). The modifier network (30) for one of the signals is said to introduce a small time delay to the low frequency component of the signal, which in terms of sinusoidal signals is said to be equivalent to a time delay (col. 4, lines 11-17). This modification of the particular frequency range of one of the signals is said to read on "shifting the phase of said first audio signal relative to said second audio signal, wherein said shifting is substantially limited to a first frequency range". After modification, the two signals are said to be combined with a summing network (34), which is said to read on "combining the audio signals from said first channel with the audio signal from the second channel".

Regarding claim 2, the time delay is said to be applied to the low frequency range of the process signal, which is said to read on "said first frequency range is the bass frequency range".

Regarding claim 3, the input to each of the modifying circuits is said to be derived from the combination of stereo input signals. The upper input signal line (20) said to be shown in FIG. 1A is said to receive a summation of two copies of the input stereo signal from a summing network (18) (col. 4, lines 1-4). The forming of this signal on the connection wire (20) is said to read on "downmixing a third channel and a fourth channel to produce a one of said first channel or said second channel".

Regarding claim 4, similar to the means discussed in regards to claim 5 [sic] [3?], the signal provided on connection line (24) is said to be formed through the subtraction of two copies of an input stereo signal with a difference network (22) (col. 4, lines 1-4). The forming of this signal, based on a copy of the stereo input signal is said to read on "the step of downmixing

the fifth channel and the sixth channel to produce the other of said first channel or said second channel".

Regarding claim 5, reference is made to the like teachings of claim 3. Regarding claim 6, reference is made to like teachings of claim 4. Regarding claim 11, reference is made to like teachings of claim 1. Regarding claim 12, reference is made to the like teachings of claim 2, noting that the time delay is applied to the low frequency portion of the signal, and not the other frequency ranges, which is said to read on "to maintain the phase of said first channel signal relative to said second channel signal unchanged over a second range". Regarding claim 13, reference is made to the like teachings of claim 2, again noting that the time delay is applied to the low frequency part of the signal. Regarding claim 14, reference is made to the like teachings of claim 1. Regarding claim 22, reference is made to the like teachings of claim 3. Regarding claim 23, reference is made to the like teachings of claim 1.

This ground of rejection is respectfully traversed as applied to the claims as amended.

"It is well settled that anticipation under 35 U.S.C. 102 requires the presence in a single reference of all of the elements of a claimed invention." *Ex parte Chopra*, 229 U.S.P.Q. 230, 231 (BPA&I 1985) and cases cited.

"Anticipation requires the presence in a single prior art disclosure of all elements of a claimed invention arranged as in the claim." *Connell v. Sears, Roebuck & Co.*, 220 U.S.P.Q. 193, 198 (Fed. Cir. 1983).

"This court has repeatedly stated that the defense of lack of novelty (i.e., 'anticipation') can only be established by a single prior art reference which discloses each and every element of the claimed invention." *Structural Rubber Prod. Co. v. Park Rubber Co.*, 223 U.S.P.Q. 1264, 1270 (Fed. Cir. 1984), citing five prior Federal Circuit decisions since 1983 including *Connell.*

In a later analogous case the Court of Appeals for the Federal Circuit again applied this rule in reversing a denial of a motion for judgment n.o.v. after a jury finding that claims were anticipated. *Jamesbury Corp. v. Litton Industrial Prod., Inc.*, 225 U.S.P.Q. 253 (Fed. Cir. 1985).

After quoting from *Connell*, "Anticipation requires the presence in a single prior art disclosure of all elements of a claimed invention arranged as in the claim," 225 U.S.P.Q. at 256,

the court observed that the patentee accomplished a constant tight contact in a ball valve by a lip on the seal or ring which interferes with the placement of the ball. The lip protruded into the area where the ball will be placed and was thus deflected after the ball was assembled into the valve. Because of this constant pressure, the patented valve was described as providing a particularly good seal when regulating a low pressure stream. The court quoted with approval from a 1967 Court of Claims decision adopting the opinion of then Commissioner and later Judge Donald E. Lane:

> [T]he term "engaging the ball" recited in claims 7 and 8 means that the lip contacts the ball with sufficient force to provide a fluid tight seal. *** The Saunders flange or lip only sealingly engages the ball 1 on the upstream side when the fluid pressure forces the lip against the ball and never sealingly engages the ball on the downstream side because there is no fluid pressure there to force the lip against the ball. The Saunders sealing ring provides a compression type of seal which depends upon the ball pressing into the material of the ring. *** The seal of Saunders depends primarily on the contact between the ball and the body of the sealing ring, and the flange or lip sealingly contacts the ball on the upstream side when the fluid pressure increases. 225 U.S.P.Q. at 258.

Relying on *Jamesbury*, the ITC said, "Anticipation requires looking at a reference, and comparing the disclosure of the reference with the claims of the patent in suit. A claimed device is anticipated if a single prior art reference discloses all the elements of the claimed invention as arranged in the claim." *In re Certain Floppy Disk Drives and Components Thereof*, 227 U.S.P.Q. 982, 985 (U.S. ITC 1985).

At least because the reference fails to disclose the substantially constant phase shift called for by all the claims, the reference can not anticipate the claims as amended. As the Examiner has observed, the reference discloses using time delay. Using time delay to introduce phase shift as shown in FIG. 2, induces phase shift that is a function of frequency (col. 4, lines 35-41). An advantage of the claimed invention calling for substantially constant phase shift is the especially desirable property of producing a similar boost in the output, regardless of the phase and correlation relationship of the input signals as explained on page 6, lines 14-16 and 23-29 of the specification. Accordingly, withdrawal of the rejection of claims 1-6, 11-14, 22 and 23 as

anticipated by the reference is respectfully requested. If this ground of rejection is repeated, the Examiner is respectfully requested to quote verbatim the language in the reference regarded as corresponding to each element in these rejected claims.

5. Claims 24-26 stood rejected under 35 U.S.C. §102(b) as anticipated by Fellgett. These claims have been canceled without prejudice.

6. Claims 7 and 15-17 as originally presented stood rejected under 35 U.S.C. §103(a) as unpatentable over Robinson as applied to claims 1-6, 11-14, 22 and 23 and further in view of Greisinger as a secondary reference. The primary reference is said to disclose circuitry for improving the low frequency output of a stereo speaker system, in which the improvement involves the phase shifting of one process signal in regards to another. The phase shift is said to be applied in the system of the primary reference with a time delay (col. 4, lines 13-17). The primary reference is said not to specify that each of the signal relative shifting involves an all-pass filter and filtering the respective first and second audio signals from the respective audio channels and that the parameters of the all-pass filters are selected such that the shifting occurs only over the specified frequency range. The secondary reference is said to disclose the concept of driving two separate speakers with two different signals, wherein the different driving signals involve low frequency portions that are particularly out of phase with each other. The phase difference between the two signals is said to be incorporated through the use of all-pass filters that apply a phase shift to the low frequencies, but leave the high frequencies unaffected (page 21, lines 25-30). The shifting is said to occur for both of the involved signal processing paths, and the resulting phase difference between the two signals is said to be 90 degrees (page 21, lines 30-31, and page 22, line 1). The shifting performed by the filter in the actual application of the filter is said to read on "shifting involves applying said first audio signal to a circuit including a first all-pass filter" and "filtering said audio signal from said first audio channel" as well as the similar application and processing limitations for the second signal. The shifting of the signal in only the low frequency ranges by the filters is said to read on "wherein parameters of said first all-pass filter and parameters of said second all-pass filter are selected so that said relative shifting occurs only over said first frequency range".

It is said to one of ordinary in the art at the time the invention was made, it would have been obvious to include the signal shifting means of the secondary reference into the processing system of the primary reference. The motivation behind such a modification would have been that the primary reference gives the circuit level details regarding the implementation of the components, which would have enabled modifications to the shifting circuitry to be easily made. The scheme of the secondary reference is said to also involve phase shifting of both involved signals, redundancy that it is said would have benefited the dual processing means of the system of the primary reference. Regarding claim 15, reference is made to the like teachings of claim 7. Regarding claim 16, reference is made to the like teachings of claim 7. Regarding claim 17, reference is made to the like teachings of claim 2.

This ground of rejection is respectfully traversed at least as applied to the claims as amended. "The mere fact that the prior art could be so modified would not have made the modification obvious unless the prior art suggested the desirability of the modification." *In re Gordon*, 221 U.S.P.Q. 1125, 1127 (Fed. Cir. 1984).

"Although the Commissioner suggests that [the structure in the primary prior art reference] could readily be modified to form the [claimed] structure, '[t]he mere fact that the prior art could be so modified would not have made the modification obvious unless the prior art suggested the desirability of the modification.'" *In re Laskowski*, 10 U.S.P.Q. 2d 1397, 1398 (Fed. Cir. 1989).

"The claimed invention must be considered as a whole, and the question is whether there is something in the prior art as a whole to suggest the desirability, and thus the obviousness, of making the combination." *Lindemann Maschinenfabrik GMBH v. American Hoist & Derrick*, 221 U.S.P.Q. 481, 488 (Fed. Cir. 1984).

"Obviousness cannot be established by combining the teachings of the prior art to produce the claimed invention, absent some teaching or suggestion supporting the combination. Under Section 103, teachings of references can be combined *only* if there is some suggestion or incentive to do so." *ACS Hospital Systems, Inc. v. Montefiore Hospital*, 221 U.S.P.Q. 929, 933 (Fed. Cir. 1984) (emphasis in original, footnotes omitted).

"The critical inquiry is whether 'there is something in the prior art as a whole *to suggest* the desirability, and thus the obviousness, of making the combination. [citing *Lindemann* with emphasis added.]'" *Fromson v. Advance Offset Plate, Inc.*, 225 U.S.P.Q. 26, 31 (Fed. Cir. 1985).

We have shown above that the primary reference does not disclose maintaining a constant phase shift to form the combined bass signal, but instead discloses using delay that introduces a phase shift that is a function of frequency. The secondary reference does not overcome the shortcomings of the primary reference in disclosing driving separate speakers with a 90 degree phase shift. It is thus impossible to combine the references to meet the terms of the rejected claims.

"Moreover, we observe that even if these references were combined in the manner proposed by the examiner, that which is set forth in appellant's claims . . . would not result." *Ex parte Bogar*, slip op. p.7 (BPA&I Appeal No. 87-2462, October 27, 1989). "Even if we were to agree with the examiner that it would have been obvious to combine the reference teachings in the manner proposed, the resulting package still would not comprise zipper closure material that terminates short of the end of the one edge of the product containing area, as now claimed." *Ex parte Schwarz*, slip op. p.5 (BPA&I Appeal No. 92-2629 October 28, 1992). "Although we find nothing before us indicating why it would be desired to combine the references in the manner urged by the examiner, it is clear to us that such a modification by itself would not result in that which is set forth in the claims." *Ex Parte Kusko*, 215 U.S.P.Q. 972, 974 (BPA&I 1981). That it is impossible to combine the references to meet the terms of the rejected claims is reason enough for withdrawing the rejection of them.

Accordingly, withdrawal of the rejection of claims 7 and 15-17 as unpatentable over the primary and secondary references is respectfully requested. If this ground of rejection is repeated, the Examiner is respectfully requested to quote verbatim language in the references regarded as corresponding to each element in these rejected claims, and quote verbatim the language in the references regarded as suggesting the desirability of combining what is there disclosed to meet the terms of these rejected claims.

7. Claims 8 and 9 as originally presented stood rejected under 35 U.S.C. §103(a) as being unpatentable over Robinson as a primary reference as apparently applied in connection with rejecting claims 1-6, 11-14, 22 and 23 and further in view of Cooper as a secondary reference. The primary reference is said to disclose circuitry for improving the low frequency output of a stereo speaker system in which the improvement involves the phase shifting of one process signal in regards to another. The primary reference is said to not disclose adjusting the frequency response of the combined audio signals. The secondary reference is said to disclose a system for the enhancement of a stereo signal involving cross-talk cancellation and head related transfer function equalization. The embodiment shown in FIG. 1D is said to include distinct equalizing circuits (157, 159) for each of the audio signal lines (col. 7, lines 67-68 and col. 8, lines 1-4). The secondary reference is also said to disclose that the equalizing filters may be included at the output of the processing circuitry shown therein, after the process signals have been recombined (col. 8, lines 24-26). This is said to read on "adjusting the frequency response of the path carrying the combined audio signal". To one of ordinary skill in the art at the time the invention was made, it is said it would have been obvious to include the equalization circuits at the output of the signal processing means of the primary reference as said to be taught by the secondary reference. The motivation behind such a modification it is said would have been that the improvement imparted on the output signals in regards to a head related transfer function and the general equalization of the signals. Regarding claim 9, the frequency adjusting means (157, 159) are said to be equalizers, which are said to read on "said adjusting including equalizing said combined audio signal".

This ground of rejection is respectfully traversed at least as applied to the claims as amended. The primary reference does not disclose the substantially constant phase shift called for by the amended claims, and the secondary reference fails to overcome this shortcoming. It is therefore impossible to combine the primary and secondary references to meet the limitations of claims 8 and 9. Accordingly, withdrawal of the rejection of claims 8 and 9 as unpatentable over the primary and secondary references is respectfully requested. If this ground of rejection is repeated, the Examiner is respectfully requested to quote verbatim the language in the references

regarded as corresponding to each limitation in these claims and quote verbatim the language in the references regarded as suggesting the desirability of combining what is there disclosed to meet the terms of these claims.

8. Claims 10, 20 and 21 stand rejected under 35 U.S.C. §103(a) as being unpatentable over Robinson as a primary reference as apparently applied in rejecting claims 1-6, 11-14, 22 and 23 and further in view of Kuusama as a secondary reference. The primary reference is said to disclose circuitry for improving the low frequency output of a stereo speaker system in which the improvement involves the phase shifting of one processed signal in regards to another. The primary reference is said to not specify that the combining only involves the combination of spectral components in the first frequency range. The secondary reference is said to disclose a system for deriving a low frequency effect audio signal. Such a system is said to involve the low pass filtering of a combination of the surround input signals, and combining the filtered signal with a subwoofer signal, and then providing the modified signal as output or for use in combination with other channel signals (col. 4, lines 64-67 and col. 5, lines 1-16). The combination of the low-pass filtered signal and the subwoofer signal is said to read on "said combining combines only the spectral components in said first frequency range". To one of ordinary skill in the art at the time the invention was made, it is said it would have been obvious to include the low frequency signal enhancement system of the primary reference into the low frequency channel forming arrangement of the secondary reference. The motivation behind such a modification is said to have been that such signal enhancement of the primary reference would have been able to improve the low frequencies of the produced signal of the secondary reference directly. The primary reference is said to disclose the improvement of low frequency ranges between channels of signals, and the secondary reference is said to disclose the combination of several channel signals to form a low frequency signal.

Regarding claim 20, the two signals combined in the system of the secondary reference is said to include only low frequency components. While the subwoofer signal is not explicitly filtered, it is said the nature of the invention would have made obvious the inclusion of a low pass filter for altering the signal as such in order to provide the output signal in the desirable

frequency range. The concepts of the secondary reference, in view of the teachings of the primary reference, are said to read on "a first low-pass filter for filtering said first audio signal" and a second low pass filter "for filtering said second audio signal so that said combiner combines only the bass portions of said first audio signal and said second audio signal".

Regarding claim 21, the combined signal in the system of the secondary reference is said to be again low-pass filtered (9), which is said to read on a "low-pass filter for filtering the output signal of said combiner to provide only the bass portion of said combined signal" (col. 5, lines 5-8).

These grounds of rejection are respectfully traversed as applied to the claims as amended. The primary reference does not disclose the substantially constant phase shift called for by the rejected claims. It is therefore impossible to combine the primary and secondary references to meet the terms of the rejected claims. Accordingly, withdrawal of the rejection of claims 10, 20 and 21 as unpatentable over the primary and secondary references is respectfully requested. If this ground of rejection is repeated, the Examiner is respectfully requested to quote verbatim the language in the references regarded as corresponding to each limitation in the rejected claims and quote verbatim the language in the references regarded as suggesting the desirability of combining what is there disclosed to meet the terms of these rejected claims.

9. Claims 18 and 19 as originally presented stood rejected under U.S.C. §103(a) as being unpatentable over Robinson as a primary reference as apparently applied in rejecting claims 1-6, 11-14, 22 and 23 and further in view of Gerzon as a secondary reference and Peters as a tertiary reference. The primary reference is said to disclose circuitry for improving the low frequency output of a stereo speaker system, in which the improvement involves the phase shifting of one processed signal in regards to another. The secondary reference is said to disclose the use of an all-pass filter for imparting the phase shifting of the signals. However, the primary reference in view of the secondary reference is said to not specify the use of two all-pass filters in series in each of the signal processing paths. The tertiary reference is said to disclose systems with various all-pass network configurations for variously processing a stereo signal. One embodiment shown in FIG. 10 is said to involve the use of sequentially applied all-pass

filters (1L, 5aL). As the output of the second sequential all-pass filter is said to be applied to a combining circuit, this arrangement is said to read on "a third all-pass filter coupling said first all-pass filter and said combiner" and "third all-pass filter having third all-pass filter parameters". The similar processing for the other signal path is said to read on "a fourth all-pass filter coupling said first all-pass filter and said combiner" and "fourth all-pass filter having fourth filter parameters". To one of ordinary skill in the art at the time the invention was made, it is said it would have been obvious to include the sequential all-pass filters of the system of the tertiary reference in to the processing scheme of the primary reference in view of the secondary reference. The motivation behind such a modification it is said would have been that the additional all-pass filters would have enabled additional processing effects and functions to be imparted upon the audio signal before they are combined to produce the final output signals for the system. However, the primary in view of the secondary and tertiary references are said to not specify that the frequency spacing between the combination of filters is 16. The tertiary reference is said to disclose an audio system with an enhanced spatial effect. Such a system is said to involve a filter (36) with plurality of taps (41, 42) that determine the frequency spacing of the application of the filter (col. 7, lines 22-40). The tertiary reference is said to disclose a spacing of these delaying directly affects the output quality of the process signal, and that a smaller frequency spacing is preferred (col. 7, lines 32-40). A smaller relative frequency spacing, in view of the art, is said to provide the obvious improvement of higher processing resolution for the involved frequencies. The relative natures of the teachings of the quaternary reference and the system of the primary reference in view of the secondary and tertiary references is said to enable these teachings to read on "wherein the first and third all-pass filters have a frequency spacing of approximately 16 and wherein said second and fourth all-pass filters have a spacing of approximately 16".

To one of ordinary skill in the art at the time the invention was made, it is said it would have been obvious to include the preference of a relatively small frequency spacing as said to be disclosed for the system of the quaternary reference into the enhancement arrangement of the primary reference in view of the secondary reference and tertiary reference. The motivation

behind such modification it is said would have been the higher frequency resolution and improved processing for smaller frequency segments of the audio signal. Regarding claim 19, reference is made to the like teachings of claim 18, noting again that the quaternary reference is said to disclose a preference for small frequency spacing between delay elements.

This ground of rejection is respectfully traversed. The primary reference does not disclose the substantially constant phase shift in the rejected claims. Therefore, it is impossible to combine the primary, secondary, tertiary and quaternary references to meet the terms of these rejected claims. Accordingly, if this ground of rejection is repeated, the Examiner is respectfully requested to quote verbatim the language in the references regarded as corresponding to each limitation in these rejected claims and quote verbatim the language in the references regarded as suggesting the desirability of combining what is there disclosed to meet the terms of these claims.

10. Claims 24, 27 and 28 as originally presented stood rejected under 35 U.S.C. §103(a) as being anticipated by Robinson as a primary reference and further in view of Klayman as a secondary reference. These claims have been canceled without prejudice.

In view of the foregoing cancellations, amendments, authorities, remarks and the inability of the prior art, alone or in combination, to anticipate, suggest or make obvious the subject matter as a whole of the invention disclosed and claimed in this application, all the claims are submitted to be in a condition for allowance, and notice thereof is respectfully requested. Should the Examiner believe the application is not in a condition for allowance, he is respectfully requested to telephone the undersigned attorney at (617) 521-7014 to discuss what additional steps he believes are necessary to place the application in a condition for allowance.

Enclosed is a $110 check for the Petition for Extension of Time fee. Please apply any other charges or credits to deposit account 06-1050, Order No. 02103-397001.

Respectfully submitted,

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